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Ephemeris of the Variable Stars for 1859. By Norman Pogson, Esq., Director of the Hartwell Observatory.

(*Communicated by Dr. Lee.*)

In the following ephemeris the initials in the sixth column represent the following names:—A., Argelander; An., Anvers; B., Baxendell; K., Krüger; P., Pogson; S., Schönfeld; W., Winnecke.

Star.	Probable Mag.	Mean Place, 1860. R.A.	Mean Place, 1860. N.P.D.	Times of Maxima.	Authority.
		h m s	° ′		
T Piscium	9·5	0 24 46	76 14	End of July and middle of December	S.
α Cassiopeiæ	2·0	0 32 35	34 14	March 9, May 27, Aug. 14, Nov. 1	A.
S Piscium	9·0	1 10 15	31 48	Middle of April	—
R Piscium	7·5	1 23 25	87 50	End of June	—
ο Ceti	2·0	2 12 17	93 37	October 6	A.
R Tauri	8·0	4 20 38	80 9	September 14	W.
S Tauri	10·0	4 21 33	80 22	Middle of March	W.
R Orionis	9·0	4 51 22	82 5	May 14	W.
α Orionis	1·0	5 47 36	82 37	Early in May and middle of November	—
R Geminorum	7·3	6 58 56	67 5	Not until 1860, January 2 ...	P.
R Can. Min.	8·0	7 1 0	79 45	Middle of April	—
S Can. Min.	8·5	7 25 7	81 23	September 11	S.
S Geminorum	9·2	7 34 38	66 14	May 30	P.
T Geminorum	8·9	7 40 54	65 55	March 17, December 31 ...	P.
U Geminorum	9·1	7 46 48	67 38	Feb. 21, May 29, Sept. 3, Dec. 9	P.
R Cancri	6·0	8 8 57	77 53	March 25	A.
U Cancri	10·0	8 27 45	70 37	April 7	W.
S Hydræ	8·5	8 46 15	86 24	March 31, December 11 ...	S.
T Hydræ	6·5	8 48 51	98 37	End of April	W.
R Leonis	5·0	9 40 2	77 55	March 8 (Minimum (10·0), Aug. 13)	P.
R Urs. Maj.	7·0	10 34 41	20 29	Jan. 5, Nov. 3 (Minimum, July 15)	P.
R Comæ	8·0	11 57 4	70 26	End of October	W.
R Virginis	6·5	12 31 24	82 14	March 21, August 13 ...	A.
S Urs. Maj.	7·9	12 37 48	28 8	Feb. 17, Sept. 28 (Minimum, June 25)	P.
U Virginis	7·8	12 44 0	83 41	Possibly early in March and Dec.	—
R Hydræ	4·0	13 22 5	112 33	May 31, irregular	B.
S Virginis	6·0	13 25 42	96 28	April 23	P.
S Serpentis	8·0	15 15 8	75 11	April 9	A.
R Coronæ	6·0	15 42 49	61 25	Early in October; very irregular	—
R Serpentis	6·5	15 44 15	74 26	September 17	A.

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Star.	Probable Mag.	Mean Place, 1860. R.A.	Mean Place, 1860. N.P.D.	Times of Maxima.	Authority.
		h m s	° '		
R Herculis	8·0	15 59 56	71 15	May 26	B.
S Scorpii	9·0	16 9 17	112 33	End of April; doubtful ...	P.
R Scorpii	9·0	16 9 21	112 35	Very doubtful; not expected in 1859	P.
S Ophiuchi	9·5	16 26 12	106 53	May 13, December 28 ...	P.
S Herculis	9·0	16 45 32	74 49	May 12	B.
R Ophiuchi	7·6	16 59 44	105 54	March 13	P.
α Herculis	3·0	17 8 16	75 27	Feb. 7, April 14, June 20, Aug. 25, Oct. 30	A.
T Herculis	7·9	18 3 48	59 0	February 20, July 30 ...	K.
R Scuti	5·0	18 40 1	95 50	Jan. 28, April 9, June 20, Aug. 31, Nov. 10; irregular ...	A.
13 Lyræ	4·3	18 51 4	46 14	Jan. 15, March 2, April 17, June 3, July 19, Sept. 3, Oct. 19, Dec. 4	B.
R Aquilæ	6·5	18 59 40	81 59	June 23	W.
R Sagittarii	8·2	19 8 28	109 33	Possibly early in October ...	P.
R Cygni	8·0	19 33 4	40 7	June 12	P.
χ Cygni	5·0	19 45 11	57 27	January 29	A.
U Capricorni	10·7	20 40 22	105 18	Possibly about the end of December	P.
T Capricorni	9·0	21 14 17	105 45	July 26	S.
β Pegasi	2·0	22 56 59	62 41	Feb. 5, March 21, May 3, June 16, July 29, Sept. 10, Oct. 24, Dec. 6	An.
R Pegasi	8·5	22 59 38	80 13	March 21	A.
R Aquarii	7·0	23 37 15	106 3	June 2	A.
R Cassiopeiæ	6·0	23 51 18	39 23	April 12	P.

Minima of the Short Period Variable Stars during 1859 in G.M.T. and for the Earth's Mean Distance from each Star.

Algol.

Maximum 2·3; Minimum 4·0. Whole variation completed in seven hours.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	3	13	9	April	2	10	24	Sept.	21	11	16	Nov.	9	5	7
	6	9	58		5	7	13		24	8	5		20	16	22
	9	6	47		25	8	55	Oct.	8	16	9		23	13	11
	26	11	40	June	24	14	1		11	12	58		26	10	0
	29	8	29	July	17	12	32		14	9	47		29	6	49
Feb.	1	5	18	Aug.	6	14	14		17	6	36	Dec.	10	18	4
	18	10	11		9	11	3		28	17	51		13	14	53
	21	7	0		26	15	56		31	14	40		16	11	42
Mar.	10	11	53		29	12	45	Nov.	3	11	29		19	8	31
	13	8	42	Sept.	1	9	34		6	8	18		22	5	20

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λ *Tauri.*

Max. 4·0; Min. 4·5. Variation rapid.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	1	6	8	Aug.	10	14	51	Nov.	1	15	7	Nov.	21	9	28
	5	5	0		14	13	43		5	14	0		25	8	21
Mar.	17	8	40		18	12	36		9	12	52		29	7	13
	21	7	32		22	11	28		13	11	44	Dec.	3	6	5
Aug.	6	15	59	Oct.	28	16	15		17	10	36		7	4	57

ζ *Geminorum.*

Max. 3·8; Min. 4·5. Increasing $5^{d}\,6^{h}$.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	9	5	24	Mar.	21	8	0	Oct.	20	15	48	Dec.	30	18	24
	19	9	12		31	11	48	Dec.	10	10	48				
	29	13	0	Oct.	10	12	0		20	14	36				

S *Cancri.*

Max. 8·0; Min. 10·5. Variation rapid.

R.A. $8^{h}\,35^{m}\,56^{s}$; N.P.D. 70° 28′.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	16	15	19	April	2	12	15	June	17	9	10	Dec.	14	13	51
Feb.	4	14	33		21	11	28	Oct.	18	16	10				
	23	13	47	May	10	10	42	Nov.	6	15	24				
Mar.	14	13	1		29	9	56		25	14	37				

β *Lyræ.*

Principal Minimum (4·3); First Max. (3·4) about $3^{d}\,2^{h}$ after.
Second Min. (3·8) about $6^{d}\,9^{h}$ after.; Second Max. (3·4) about $9^{d}\,10^{h}$ after.

	d	h	m		d	h	m		d	h	m		d	h	m
Feb.	11	17	50	Mar.	9	13	21	July	16	14	53	Aug.	11	10	23
	24	15	36		22	11	6		29	12	38		24	8	8

η *Aquilæ.*

Max. 3·6; Min. 4·4. Increasing $2^{h}\,9^{d}$.

	d	h	m		d	h	m		d	h	m		d	h	m
Feb.	15	18	12	June	10	13	57	Aug.	21	8	18	Nov.	8	6	53
Mar.	23	15	22	July	16	11	7		28	12	32	Dec.	14	4	3
April	28	12	33		23	15	22	Oct.	3	9	42				

δ *Cephei.*

Max. 3·7; Min. 4·8. Increasing $1^{d}\,14^{h}$.

	d	h	m		d	h	m		d	h	m		d	h	m
Jan.	4	16	31	Mar.	15	10	51	July	11	12	20	Nov.	6	13	48
	15	10	6		31	13	14		27	14	43		17	7	24
	20	18	54	April	16	15	37	Aug.	23	10	41		22	16	11
	31	12	29		27	9	12	Sept.	8	13	4	Dec.	3	9	47
Feb.	11	6	5	May	13	11	35		24	15	27		19	12	10
	16	14	52		29	13	58	Oct.	5	9	2		30	5	45
	27	8	28	June	25	9	57		21	11	25				

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The corrections to be applied to the observed times of minima of the short-period variables, before comparing with the ephemeris may be found by the formulæ on page 27 of vol. xvii. of the *Monthly Notices.*

With very few exceptions, the same elements have been employed in preparing this as in the last year's ephemeris. When no authority is stated, the times of maxima must only be regarded as indications as to when a search will prove most beneficial for the determination of the elements of variation of such star. If invisible, a mere record of such being the case will, by contradicting the assumed elements, remove an erroneous prediction from the next ephemeris, and thereby possess great interest and value. For the short-period variables (all of which except λ *Tauri* are from Prof. Argelander's elements), those minima only are tabulated which occur when the sun is considerably below, and the star at least ten degrees above, the horizon.

I have again to acknowledge my obligation to Mr. Baxendell for having obligingly communicated the ephemerides of λ *Tauri*, 13 *Lyræ*, R and S *Herculis*, based upon elements derived from his own observations.

The unavoidable delay in the preparation of this little annual contribution is a matter of much regret, but one which, I am happy to say, is not likely to happen again. Change of residence, and other pressing interruptions, all conspired to derange my plans, and throw me behind in their execution. The variable stars are, however, marked out as special objects of observation and investigation in Dr. Lee's Observatory, and I shall therefore hope to have the ephemeris for 1860 in print before the close of the present year.

Hartwell Observatory, April 11, 1859.

Results of the Observations of Small Planets, made at the Royal Observatory, Greenwich, in the month of March, 1859.

(*Communicated by the Astronomer Royal.*)

Astræa ⑤.

Mean Solar Time of Observation.		Apparent R.A.	Apparent N.P.D.
	h m s	h m s	° ′ ″
1859, Mar. 7	12 59 34·0	12 0 24·08	84 29 56·20
9	12 50 12·9	11 58 54·56	84 13 7·18

Metis ⑧.

Mean Solar Time of Observation.		Apparent R.A.	Apparent N.P.D.
	h m s	h m s	° ′ ″
1859, Mar. 31	14 14 41·2	14 50 20·95	100 57 18·71